New England Common Assessment Program

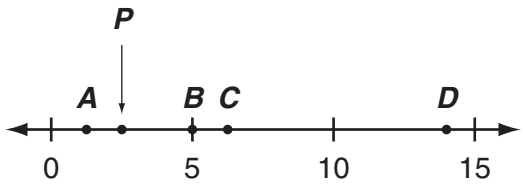
Released Items 2007

Grade 11 Mathematics

Mathematics

Item selected from Session One—no calculators or other mathematics tools allowed.

1 Look at this number line.



If point P represents $\sqrt{x}$, which point is closest to the value of x?

A. point A
B. point B
C. point C
D. point D

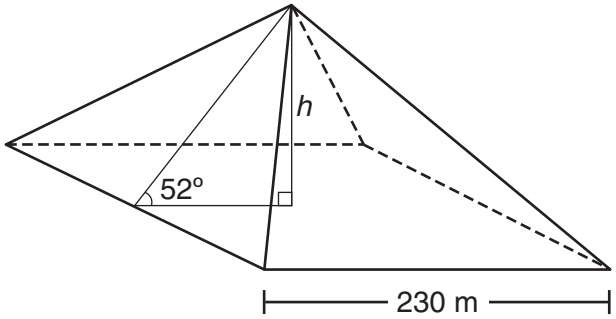
2 Renata is a sales representative for a printer company. She sells two models of printers—Model P and Model Q.

- Last month she sold a total of 120 printers.
- The ratio of Model P printers sold to Model Q printers sold was 3:5.

If Renata is paid a $25 commission for every Model P printer sold and a $20 commission for every Model Q printer sold, what was her total commission last month?

A. $1480
B. $2475
C. $2625
D. $2760

3 This diagram shows the angle of inclination of the triangular faces of the Great Pyramid in Egypt.



When it was built, the length of each side of the square base was 230 meters. Which equation represents the height, h, of the Great Pyramid when it was built?

A. $h = 115 \sin 52°$

B. $h = 115 \tan 52°$

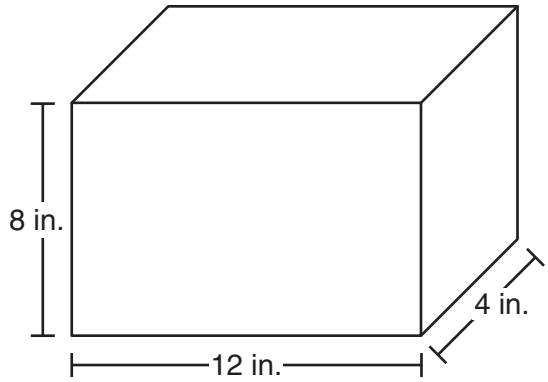
C. $h = \frac{115}{\sin 52°}$

D. $h = \frac{115}{\tan 52°}$

4 What are the coordinates of the image of point $P(-3, -7)$ after a reflection about the line $y = 2$?

A. $(-3, 9)$
B. $(-3, 11)$
C. $(5, -7)$
D. $(7, -7)$

5 Look at this rectangular prism.



What could be the dimensions of a rectangular prism that is similar to this rectangular prism?

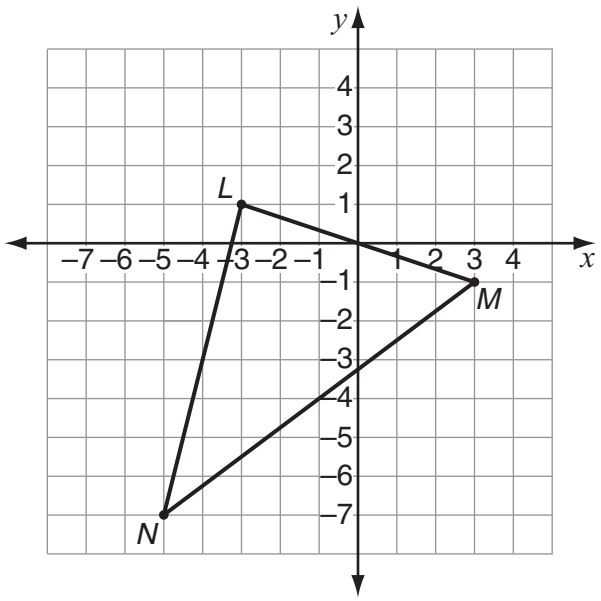
A. 6 in., 2 in., 1 in.

B. 9 in., 6 in., 3 in.

C. 15 in., 11 in., 7 in.

D. 24 in., 8 in., 4 in.

6 Look at ΔLMN on this grid.



What is the length, in units, of $\overline{MN}$?

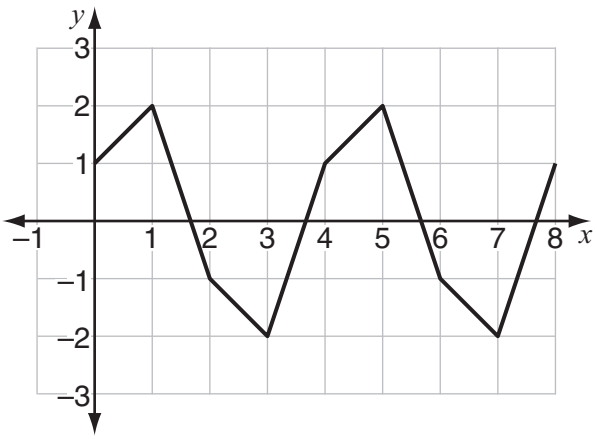
A. 6

B. 8

C. 9

D. 10

7 Look at this function.



As the value of x increases, the y-values form a repeating pattern. If this pattern continues, what is the y-value when $x = 26$?

A. –2
B. –1
C. 1
D. 2

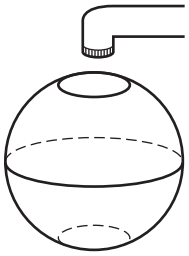
8 A guitar manufacturer uses a computer-controlled machine to make electric guitars. The table below shows the total number of guitars made after 2, 4, 8, and 16 hours.

Hours (h)	Total Number of Guitars Made (g)
2	18
4	42
8	90
16	186

If g represents the total number of guitars made after h hours, which equation represents the pattern shown in the table?

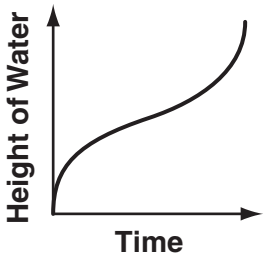
A. $g = 12h - 6$
B. $g = 12h$
C. $g = 3h^2 - 6$
D. $g = 3h^2 + 6$

9 Look at this container.

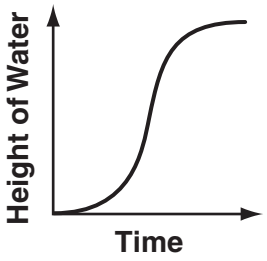


Water flows into this container at a constant rate. Which graph could represent the height of the water in the container over time?

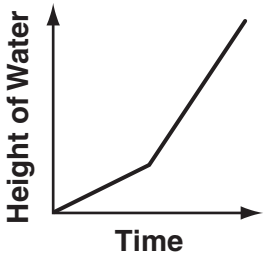
A.



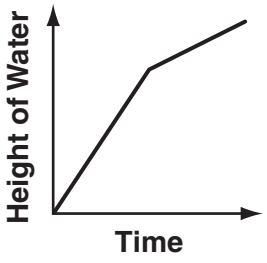
B.



C.



D.



10 What is the range of the function $f(x) = x^2 + 3$ if the domain is $\{-3, 0, 3\}$?

A. $\{3, 12\}$

B. $\{-6, 3, 12\}$

C. all real numbers

D. all real numbers greater than or equal to 3

11 The typical wingspan of the little blue heron is 4 inches more than half the typical wingspan of the great blue heron. If g represents the typical wingspan of the great blue heron, which expression represents the typical wingspan of the little blue heron?

A. $4\left(\frac{1}{2}g\right)$

B. $\frac{1}{2}g + 4$

C. $2g + 4$

D. $\frac{1}{2}(g + 4)$

12 The sum of three consecutive odd integers is 21. If x is the least of these odd integers, which equation **must** be true?

A. $3x = 21$

B. $3x + 3 = 21$

C. $3x + 4 = 21$

D. $3x + 6 = 21$

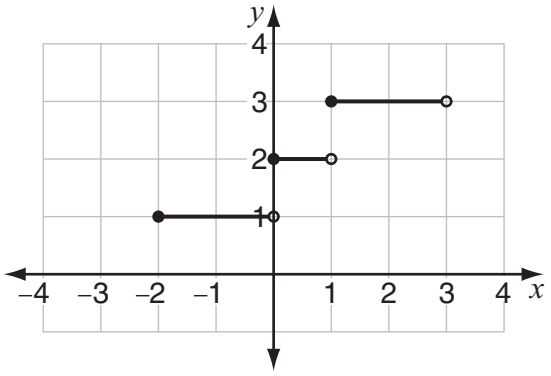
13 Look at this inequality.

$$|x + 5| \leq 2$$

List all **integer** values of x that make the inequality true.

14 A square with a side length of 8.0 cm is rolled up, without overlap, to form the lateral surface of a cylinder. What is the radius of the cylinder to the nearest tenth of a centimeter?

15 Look at this graph of a function.



What is the range of this function?

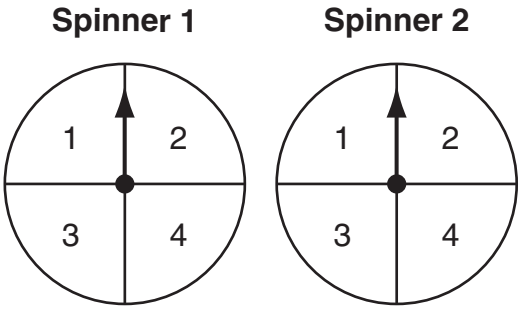
16 Zack has $60 to spend on a fish tank, supplies, and some fish.

- The fish tank and supplies cost $29.50.
- Each fish costs $2.70.

What is the maximum number of fish that Zack can buy?

17 Al, Chris, Janet, and Tara will each give a speech to their class. In how many different orders can they give their speeches if Al must speak immediately after Tara?

18 Look at these spinners.



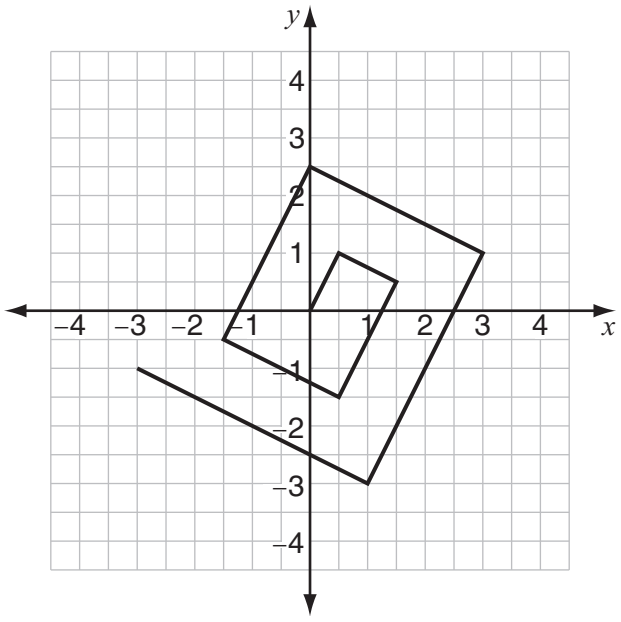
Gary will spin the arrow on each spinner once and record the sum of the two numbers the arrows land on. What is the probability that the sum of the two numbers will be a prime number?

19 The Doucettes produce and sell maple syrup.

- Each year they sell all the maple syrup they produce.
- Last year they sold 640 gallons of maple syrup.
- This year they will sell maple syrup at a price that is 20% lower than it was last year.

How many gallons of maple syrup must the Doucettes sell this year so their income from maple syrup sales stays the same as it was last year? Show your work or explain how you know.

20 Starting at the origin, Nadia drew eight line segments on this coordinate grid.

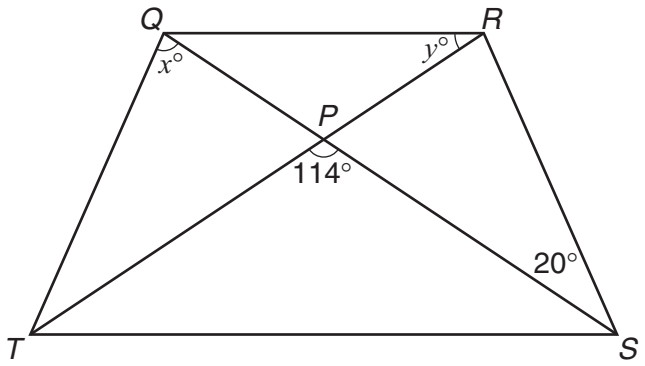


Nadia continues her pattern. What is the slope of the 25th line segment she will draw? Show your work or explain how you know.

21 The manager of a music store ordered 20 new violins. She ordered some of two different models—the standard and the deluxe. Each standard violin costs $500, and each deluxe violin costs $800.

If the manager spent exactly $11,500 on these violins, how many deluxe violins did she order? Show your work or explain how you know.

22 Look at this diagram.



not drawn to scale

- Quadrilateral $QRST$ has diagonals $\overline{QS}$ and $\overline{RT}$ that intersect at point P.
- Triangle QPT is congruent to triangle RPS ($\Delta QPT \cong \Delta RPS$).

a. What is the value of x? Show your work or explain how you know.

b. What is the value of y? Show your work or explain how you know.

23 A car dealer has 75 new vehicles. This table shows how the new vehicles are distributed by type and color.

	Cars	Trucks	Vans
Tan	5	2	3
Black	5	7	6
Red	4	2	2
Blue	6	6	8
Other	7	9	3

The sales manager plans to select one vehicle at random for a special promotion.

a. What is the probability that the vehicle selected will be a car?

b. If the vehicle selected is a van, then what is the probability that the van is black?

c. What is the probability that the vehicle selected will be either black or a van? Show your work or explain how you know.

Grade 11 Mathematics Released Item Information

Released Item Number	1	2	3	4	5	6	7	8	9	10	11	12
No Tools Allowed	✓	✓		✓				✓	✓	✓		
Content Strand[1]	NO	NO	GM	GM	GM	GM	FA	FA	FA	FA	FA	FA
GSE Code	10-2	10-4	10-2	10-4	10-5	10-9	10-1	10-2	10-2	10-2	10-3	10-4
Depth of Knowledge Code	2	2	1	2	2	1	2	1	2	1	1	2
Item Type[2]	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC
Answer Key	C	C	B	B	B	D	B	A	A	A	B	D
Total Possible Points	1	1	1	1	1	1	1	1	1	1	1	1

Released Item Number	13	14	15	16	17	18	19	20	21	22	23
No Tools Allowed	✓					✓	✓			✓	
Content Strand[1]	NO	GM	FA	FA	DP	DP	NO	FA	FA	GM	DP
GSE Code	10-2	10-6	10-2	10-4	10-4	10-5	10-4	10-1	10-4	10-2	10-5
Depth of Knowledge Code	2	2	1	2	2	2	2	2	2	2	2
Item Type[2]	SA	SA	SA	SA	SA	SA	SA	SA	SA	CR	CR
Answer Key											
Total Possible Points	1	1	1	1	1	1	2	2	2	4	4

[1]Content Strand: NO = Numbers & Operations, GM = Geometry & Measurement, FA = Functions & Algebra, DP = Data, Statistics, & Probability

[2]Item Type: MC = Multiple Choice, SA = Short Answer, CR = Constructed Response